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Surface treatment devices

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Inventor: YASUMA SAGO (JP); SANEYOSHI IKIDA (JP); KAZUAKI KANEKO (JP)
Applicant: ANASHIUCHIKAKO K K (JP)
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The invention is to realize a gas ejection mechanism, which makes it possible to form a uniform gas flow and to control the temperature and its distribution over a gas plate, and thereby to provide a surface processing apparatus which can continuously carry out uniform processing. A surface processing apparatus of this invention comprises: a process chamber in which a substrate holding mechanism and a gas ejection mechanism are arranged to face each other; an exhaust means; and a gas supply means; wherein a gas distribution mechanism, a cooling or the heating mechanism provided with a coolant channel or a heater to cool or heat a gas plate and a number of gas passages, and the gas plate having a number of gas outlets communicated with the gas passages are arranged in that order from the upper stream to construct the gas ejection mechanism, and wherein the gas plate is fixed to the cooling or heating mechanism with a clamping member or with an electrostatic chucking mechanism. A second gas distribution mechanism may be installed between the gas plate and the cooling or heating mechanism so as to form gas outlets under the coolant channel.